

REMARKS

Claims 1, 13, 17, and 19-24 are pending. Claims 1, 13, and 21-22 are allowable. Claims 17, 19-20, and 23-24 are rejected under 35 U.S.C. § 112, first paragraph. Applicants address this basis for rejection as follows.

Claim amendments

Claim 17 has been amended to recite a *C. elegans* or isolated *C. elegans* cell expressing a mammalian AFX or FKHR nucleic acid sequence that hybridizes under highly stringent conditions to the complement of a nucleic acid sequence encoding the sequence of SEQ ID NO:57 or SEQ ID NO:102 and that functions in insulin signaling. Support for this amendment is found, for example, at page 55, lines 22-27, page 113, lines 2-10, and in Figure 21A, of the specification as filed. No new matter has been added by the present amendment.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 17, 19-20, and 23-24 are rejected for an asserted lack of written description and enablement in the specification.

Written description

The Office asserts (page 5):

Variants for SEQ ID NO:57 and 102 as claimed has been defined by a statement of function that broadly encompasses an insulin signaling like activity, which conveyed no distinguishing information about the identity of

the claimed genetic sequence, such as its relevant structural or physical characteristics. (Emphasis original.)

Applicants submit that claim 17, as amended, and its dependent claims are free of this basis for rejection.

As noted above, claim 17, as amended, is not directed to *any* nucleic acid sequence that hybridizes under highly stringent conditions to the complement of the nucleic acid sequence encoding the sequence of SEQ ID NOS:57 or 102, but rather is directed to *mammalian AFX or FKHR* nucleic acid sequences that hybridize under highly stringent conditions to the complement of a nucleic acid sequence encoding the sequence of SEQ ID NOS:57 or 102, which are the full-length human FKHR and AFX protein sequences, respectively. Mammalian AFX and FKHR coding sequences were known in the art at the time the application was filed. In this regard, Applicants direct the Office's attention to the February 25, 2005 and January 23, 2006 replies in which Applicants cite GenBank Accession Number U02310, UniProt Entry P98177, and the abstract of Borkhardt et al. (Oncogene 14:195-202, 1997) in support of the public availability of the human FKHR and AFX open reading frames as of the date of filing. In view of the above, one skilled in the art would clearly recognize which sequences are encompassed by the claims, and on this basis alone, Applicants submit that claim 17, as amended, finds adequate written description in the specification.

Applicants also submit that their specification provides a written description of the invention of claim 17 in sufficient detail to satisfy the standard set forth by the Patent

Office in its Written Description Guidelines and by the Federal Circuit in *Lilly*. In particular, *Lilly* specifically states that the written description of a genus of DNA may be achieved by a "recitation of structural features common to members of the genus."

Regents of University of California v. Eli Lilly & Co., 119 F.3d 1159, 43 U.S.P.Q.2d 1398 (Fed. Cir. 1997). The Guidelines for Examination of Patent Applications Under 35 U.S.C. 112 ¶1, "Written Description" Requirement, 66 Fed. Reg. 1099 (Jan. 5, 2001) similarly state:

The written description requirement for a claimed genus may be satisfied ... by disclosure of relevant, identifying characteristics, *i.e.*, structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus.

Applicants note that claim 17, as amended, requires the nucleic acid sequence that hybridizes under highly stringent conditions to the complement of a nucleic acid sequence encoding the sequence of SEQ ID NO:57 or 102 to be a mammalian AFX or FKHR nucleic acid sequence. As stated above, mammalian AFX and FKHR nucleic acid sequences were known in the art at the time the application was filed and the requirement that the claimed sequences hybridize to the full-length sequences imparts the requisite structural identifying characteristic. Consequently claim 17, as amended, clearly sets forth sufficient structural identifying characteristics for the skilled artisan to recognize that Applicants were in possession of the claimed invention at the time the application was filed.

Moreover, Applicants, in the February 25, 2005 and the January 23, 2006 replies, directed the Office's attention to Example 9: Hybridization of the U.S. Patent & Trademark Office's Written Description Guidelines (<http://www.uspto.gov/web/menu/written.pdf>; "the Guidelines"). Applicants noted that the facts of the present case are squarely within these Guidelines and that the recitation of the highly stringent hybridization requirement in claim 17 limits the claim to structurally similar nucleic acids which, when combined with the functionality requirement, describes a genus of nucleic acid molecules that is well within the written description requirement. Moreover, claim 17, as amended, now requires the nucleic acid sequences to be *mammalian AFX or FKHR* nucleic acid sequences, thereby further defining the structure of the nucleic acid sequences encompassed by the claim. As such, the highly stringent hybridization requirement of claim 17 limits the claim to sequences that, in view of the specification and Dr. Ruvkun's Declaration submitted with the July 24, 2003 reply, would be expected to function in insulin signaling.

Enablement

The Office asserts (page 7):

[A] hybridization product that encompasses any variation in the conserved domain AFX or FKHR polypeptides would certainly affect proper folding and biological activity if amino acids that are critical for such functions are substituted.

And (page 8):

In [the] instant case identification of candidate compounds that ameliorate or delay an impaired glucose tolerance condition, atherosclerosis or obesity by evaluating the expression of a polypeptide encoded by an uncharacterized daf-16, AFX or FKHR like polypeptide is not considered routine in the art.

Applicants disagree.

Claim 17, as amended, is directed to a method that makes use of mammalian AFX or FKHR nucleic acid sequences hybridizing under highly stringent conditions to the complement of a nucleic acid sequence encoding the sequence of SEQ ID NO:57 or SEQ ID NO:102 and that function in insulin signaling. Applicants submit that claim 17, and its dependent claims, are enabled by the specification as filed.

Applicants note that the test of enablement is "whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with the information known in the art without undue experimentation," *Hybritech, Inc. v. Monoclonal Antibodies, Inc.* 802 F.2d. 1318 (Fed. Cir. 1985). The test for undue experimentation is not merely quantitative, since a considerable amount of experimentation is permissible if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. As detailed below, Applicants submit that it would not require undue experimentation to make and use the invention within the full scope of claim 17, as amended.

In particular, given that mammalian AFX and FKHR sequences were known at the

time the application was filed, identifying sequences that fall within the scope of claim 17 requires nothing more than standard methods and routine experimentation. Moreover, as noted in Applicants' last reply, identifying whether a sequence encompassed by claim 17 encodes a polypeptide that functions in insulin signaling is also standard in the art. Exemplary assays that may be used to determine whether a polypeptide functions in insulin signaling include the mammalian cell culture and *C. elegans* assays described, for example, at page 20, lines 9-12, page 80, lines 1-16, and page 90, line 12, to page 91, line 15, of the specification.

In sum, Applicants submit that claim 17, as amended, in being directed to the use of mammalian AFX or FKHR sequences that hybridize under highly stringent conditions to the complement of a nucleic acid sequence encoding the sequence of SEQ ID NO:57 or 102, sets forth sufficient structural features for one skilled in the art to recognize that Applicants were in possession of the presently claimed invention at the time of filing. Mammalian AFX and FKHR sequences were known at the time the application was filed and, therefore, one skilled in the art would not only recognize which sequences are encompassed by the present claims, but also would know how to make and use these sequences in the presently claimed method. Hence, Applicants submit that the specification as filed meets the written description and enablement requirements of 35 U.S.C. § 112, first paragraph, for claim 17, as amended. The § 112, first paragraph rejections of claim 17 and its dependent claims should be withdrawn.

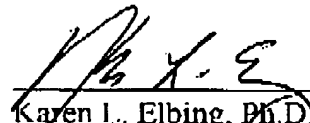
CONCLUSION

The Office, in the present Office Action states that claims 1, 13, and 21-22 are allowable. Applicants submit that, in view of the present amendment to claim 17, claims 17, 19-20, and 23-24 are now also in condition for allowance, and this action is hereby respectfully requested.

If there are any charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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